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LETTER TO THE EDITOR

Evaluation of morbidity, mortality and outcome following cervical spine injuries in elderly patients (S. A. Malik et al.)

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Dear Editor,

We have read with interest the retrospective case series by Malik et al. [7] evaluating morbidity, mortality and outcome following cervical spine injuries in 107 elderly patients. Like others, this study stresses the clinical importance of cervical spine injuries within the elderly population [5, 8, 10]. However, after reading the publication carefully, several major concerns raised with respect to the validity of the conclusions the authors draw.

Primary concern is the approach Malik et al. used to select eligible patients for inclusion. While registration of included patients was performed within Ireland's national spinal injury unit, 92% of included subjects were referrals from other hospitals in Ireland. As a consequence, referral bias results in suboptimal comparisons of results with other (homogeneous) study populations. Referral bias is not a new concept, it has been reported earlier in Alzheimer's disease studies [2, 6, 9].

During the period 1994–2002 “a standard cervical radiographic series consisting of anteroposterior, open mouth odontoid, and lateral radiographs” was obtained in each included patient. Other diagnostic investigations included MRI and CT scans. Remarkably, in the conclusion section the authors recommend the use of a “standard protocol to evaluate a potential cervical spine injury” by citing two articles published in 2000 [1, 4]. Since Malik et al. included patients from 1994 on, and did not use cited diagnostic work up algorithm, the validity of the authors' conclusive recommendation is questionable.

Another confusing aspect is the report of frequencies in the “morbidity” and “mortality” sections. “18.6% developed complications during follow-up.” It remains unclear how many complications were reported. Were there any patients suffering more than one complication? In addition, reported complications that occurred in 32 patients who died during follow-up have not been described consistently in the “morbidity” section. Furthermore, the reported number of deceased patients does not match with reported number of 32 patients who died: 12 patients died “in-hospital”, another 8 patients passed away in the “early-mortality” group and 15 patients deceased during “follow-up”.

Fourth item we question is the use and reporting of assessed outcome measure. Malik et al. used the psychometric “cervical spine outcome questionnaire” (CSOQ) [3]. The authors regarded the CSOQ as a “comprehensive, verified and reliable” outcome measure. Unfortunately, reported relations between outcome of injury and increasing age, co-morbidity and severity of neurological deficit were not supported by statistical analysis. In addition, no CSOQ baseline values were reported. This might have been valuable in order to detect subgroup differences. Irrespective of these methodological issues, we must conclude that the CSOQ is validated in patients with cervical spine disorders without acute injury or trauma only [3]. Therefore, we recommend to use other validated psychometric outcome measurements in future spinal trauma research.

In the discussion section another incomprehensive distinction is made by the authors. “In our study, the stable fractures and subluxations were immobilized with an orthosis (Minerva cast, Miami-J collar). Unstable fractures and ligamentous injuries were stabilized with application of a halo frame in 25 patients”. Vaccaro et al. [11] recapitulated facet joint capsules being the strongest component of the posterior tension band. Consequently,

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evident translational injuries are almost always associated with compromise of the disco-ligamentous complex. In other words, subluxations are strongly related to ligamentous injuries and should therefore better not be grouped with stable fractures.

Related to our second concern, we also could not perceive authors' following conclusion: "neurological recovery may be delayed in elderly patients but long-term functional improvement can be expected." No results concerning neurological recovery (which classification has been used?) and no detailed results of longitudinal analysis of long-term functional improvement have been presented. Again, the authors do not support their conclusions statistically.

In summary, we cannot do otherwise than to conclude the retrospective case series reported by Malik et al. [7] consists of serious flaws in both internal and external validity. We recommend spine surgeons to appraise this article critically before applying its results and conclusions into the daily care of the elderly patient with cervical spine injury. Furthermore, investigators at academic and referral centres should be aware of referral bias in clinical studies. Authors should at least report its impact on external validity in future publications.

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